

CLAIMS

1. An integrated circuit (IC) physical verification method comprising the steps of:

a. processing layout data describing positions of conductive material residing on layers of an IC including a drawn inductor having a spiral to produce recognition layer data representing a two-dimensional boundary shape of the spiral that is a composite of two-dimensional shapes of all conductive material forming the spiral, and

b. processing the recognition layer data to generate parameter data describing a shape of the spiral.

2. The method in accordance with claim 1 further comprising the step of:

c. processing the recognition layer data to determine whether the spiral has turns of uniform width.

3. The method in accordance with claim 1 further comprising the step of:

c. processing the recognition layer data to determine whether all bends in the spiral are of uniform bend angle.

4. The method in accordance with claim 1 further comprising the step of:

d. processing the recognition layer data to identify a position of the spiral.

5. The method in accordance with claim 1 wherein the parameter data indicates at least one of the following:

a length of the spiral,
a width of conductive material forming turns of the spiral, and
spacing between conductive material turns of the forming the spiral.

6. The method in accordance with claim 1 wherein the parameter data indicates at least one of the following:

a number of sides of the spiral, and
a diameter of an area bounded by the spiral.

7. The method in accordance with claim 1 further comprising the step of:

c. processing the recognition layer data to determine whether all bends in conductors forming the spiral are of uniform bend angle.

8. The method in accordance with claim 1

wherein the inductor is a center tap inductor including the spiral and a center tap coupled to a central portion of the spiral,

wherein the layout data comprises first binary data corresponding to each layer indicating positions of conductive material on the corresponding layer,

wherein the recognition layer data comprises second binary data generated as a Boolean function of the first binary data corresponding to layers upon which conductive material forming the spiral and the center tap resides, and

wherein the second binary data indicates positions of all conductive material forming the spiral and refrains from indicating positions of any conductive material forming the center tap.

9. The method in accordance with claim 1

wherein the inductor is a spiral inductor including the spiral and a spoke coupled to one end of the spiral,

wherein the layout data comprises first binary data corresponding to each layer indicating positions of conductive material on the corresponding layer,

wherein the recognition layer data comprises second binary data generated as a Boolean function of the first binary data corresponding to layers upon which conductive material forming the spiral and the spoke resides, and

wherein the second binary data indicates positions of all conductive material forming the spiral and refrains from

indicating positions of any conductive material forming the spoke.

10. The method in accordance with claim 1 wherein the boundary shape includes a plurality of polygonal shapes representing shapes of conductive material forming the spiral, and wherein step b comprises the substeps of:

b1. processing the recognition layer data to identify each polygonal shape and to determine a length of each identified polygonal shape, and

b2. summing the computed lengths of the polygonal shapes to determine a length of the spiral.

11. The method in accordance with claim 1 wherein the boundary shape includes a plurality of polygonal shapes representing shapes of conductive material forming the spiral, and wherein step b comprises the substep of:

b1. processing the recognition layer data to identify each polygonal shape and to determine a width of each identified polygonal shape.

12. The method in accordance with claim 1 further comprising the step of

c. processing the recognition layer data boundary shape to generate a netlist representation of the drawn inductor.

13. The method in accordance with claim 12 wherein the netlist representation of the drawn inductor includes data describing physical characteristics of the inductor influencing its inductance.

14. The method in accordance with claim 1 further comprising the steps of:

c. processing the recognition layer data to determine a position of the inductor within the layout based on a position of the boundary shape of its spiral indicated by the recognition layer data,

d. processing the recognition layer data to determine whether all bends in conductors forming the spiral are of uniform bend angle,

e. processing the layout data to determine whether conductive material residing on separate layers and forming portions of the spiral inductor are interconnected.

15. The method in accordance with claim 14 further comprising the steps of

f. processing the recognition layer data to determine parameters relating to a shape of the spiral influencing the spiral's inductance, and

g. processing the data representing the layout to generate a netlist description of the spiral inductor including the parameters determined at step f.

16. Computer-readable media containing software which when read and executed by a computer causes the computer to carry out an integrated circuit (IC) physical verification method comprising the steps of:

a. processing layout data describing positions of conductive material residing on layers of an IC including a drawn inductor having a spiral to produce recognition layer data representing a two-dimensional boundary shape of the spiral that is a composite of two-dimensional shapes of all conductive material forming the spiral, and

b. processing the recognition layer data to generate parameter data describing a shape of the spiral.

17. The computer-readable media in accordance with claim 16 wherein the method further comprises the step of:

c. processing the recognition layer data to determine whether the spiral has turns of uniform width.

18. The computer-readable media in accordance with claim 16 wherein the method further comprises the step of:

c. processing the recognition layer data to determine whether all bends in the spiral are of uniform bend angle.

19. The computer-readable media in accordance with claim 16 wherein the method further comprises the step of:

d. processing the recognition layer data to identify a position of the spiral.

20. The computer-readable media in accordance with claim 16 wherein the parameter data indicates at least one of the following:

a length of the spiral,
a width of conductive material forming turns of the spiral, and
spacing between conductive material turns of the forming the spiral.

21. The computer-readable media in accordance with claim 16 wherein the parameter data indicates at least one of the following:

a number of sides of the spiral, and
a diameter of an area bounded by the spiral.

22. The computer-readable media in accordance with claim 16 f wherein the method further comprises the step of:

c. processing the recognition layer data to determine whether all bends in conductors forming the spiral are of uniform bend angle.

23. The computer-readable media in accordance with claim 16

wherein the inductor is a center tap inductor including the spiral and a center tap coupled to a central portion of the spiral,

wherein the layout data comprises first binary data corresponding to each layer indicating positions of conductive material on the corresponding layer,

wherein the recognition layer data comprises second binary data generated as a Boolean function of the first binary data corresponding to layers upon which conductive material forming the spiral and the center tap resides, and

wherein the second binary data indicates positions of all conductive material forming the spiral and refrains from indicating positions of any conductive material forming the center tap.

24. The computer-readable media in accordance with claim 16

wherein the inductor is a spiral inductor including the spiral and a spoke coupled to one end of the spiral,

wherein the layout data comprises first binary data corresponding to each layer indicating positions of conductive material on the corresponding layer,

wherein the recognition layer data comprises second binary data generated as a Boolean function of the first binary data corresponding to layers upon which conductive material forming the spiral and the spoke resides, and

wherein the second binary data indicates positions of all conductive material forming the spiral and refrains from indicating positions of any conductive material forming the spoke.

25. The computer-readable media in accordance with claim 16 wherein the boundary shape includes a plurality of polygonal shapes representing shapes of conductive material forming the spiral, and wherein step b comprises the substeps of:

b1. processing the recognition layer data to identify each polygonal shape and to determine a length of each identified polygonal shape, and

b2. summing the computed lengths of the polygonal shapes to determine a length of the spiral.

26. The computer-readable media in accordance with claim 16 wherein the boundary shape includes a plurality of polygonal shapes representing shapes of conductive material forming the spiral, and wherein step b comprises the substep of:

b1. processing the recognition layer data to identify each polygonal shape and to determine a width of each identified polygonal shape.

27. The computer-readable media in accordance with claim 16 wherein the method further comprises the step of

c. processing the recognition layer data boundary shape to generate a netlist representation of the drawn inductor.

28. The computer-readable media in accordance with claim 27 wherein the netlist representation of the drawn inductor includes data describing physical characteristics of the inductor influencing its inductance.

29. The computer-readable media in accordance with claim 1 wherein the method further comprises the steps of:

c. processing the recognition layer data to determine a position of the inductor within the layout based on a position of the boundary shape of its spiral indicated by the recognition layer data,

d. processing the recognition layer data to determine whether all bends in conductors forming the spiral are of uniform bend angle,

e. processing the layout data to determine whether conductive material residing on separate layers and forming portions of the spiral inductor are interconnected.

30. The computer-readable media in accordance with claim 29 wherein the method further comprises the steps of

f. processing the recognition layer data to determine parameters relating to a shape of the spiral influencing the spiral's inductance, and

g. processing the data representing the layout to generate a netlist description of the spiral inductor including the parameters determined at step f.